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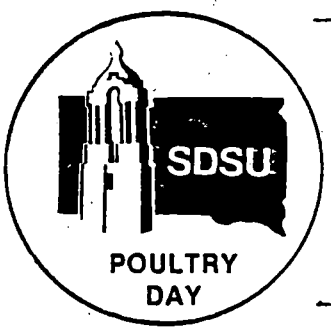

CANOLA MEAL AS A PROTEIN SUPPLEMENT FOR LAYING HENS

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Canola meal is obtained from a special strain of rapeseed developed by Canadian plant breeders to be low in erucic acid (an odd-number carbon chain fatty acid) and glucosinic acid, both of which produce undesirable effects in livestock and poultry. With the minimization of these factors, Canola could be a potential for supplying some of the protein needs in animal feeds, and already has become popular in the western Canadian provinces. Because of this it was deemed appropriate to consider Canola for egg production in studying protein sources at South Dakota State University.

Eight replicates of twelve 35-week old hens were fed each diet in a study to evaluate the use of Canola meal as the only protein supplement in 13, 15 and 17% protein diets. Sunflower and soybean meal were also compared with each other and to Canola meal. Lysine and methionine were made adequate in all diets according to NRC standards. Criteria were egg production, egg weight and albumen quality, feed intake and efficiency and mortality.

The data for egg production after five 4-week periods are shown in Table 1. The only significant affects were that of reduced performance with the 13% protein series. There were no significant differences evident due to protein source. Similarly, through eight periods (Table 2) there were no overall differences due to protein source, nor in the final standings was the difference due to protein level significant. An interaction is evident, in that with soybean or sunflower meal the low protein diets produced poorer performance, where the opposite was evident with Canola meal.

The data for feed conversion (Table 3) show that only the 13% protein diets were significantly poorer than the 15 or 17% protein diets. Though the higher fiber levels of sunflower and Canola meals would be expected to reduce performance, the differences were not significant. Mortality (Table 4) appeared to be lowest for sunflower meal and highest for the higher levels of Canola meal, but the differences were not significant.

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With adequate amino acid fortification these data indicate that either Canola, sunflower or soybean meal can be used for satisfactory performance of laying hens. No adverse effects on egg quality were noted.

Table 1. Effect of Protein Supplement and Protein Level of Egg Production, %

Protein Source	Dietary Protein Level - % 35-55 wks of age 17	15	13	Means
Soybean Meal	80.2	79.4	71.8	77.1
Sunflower Meal	78.1	76.2	75.2	76.5
Canola Meal	77.0	76.1	78.8	77.3
Means	78.4[a]	77.2[a,b]	75.2[b]	

[a,b] Values with unlike superscript are significantly different (P<.01).

Table 2. Effect of Protein Supplement and Protein Level on Egg Production, %

Protein Source	Dietary Protein Level - % 35-67 wks of age 17	15	13	Means
Soybean Meal	75.1	74.6	66.6	72.1
Sunflower Meal	74.2	71.6	70.3	72.0
Canola Meal	70.4	70.3	74.6	71.8
Means	73.2[a]	72.2[a]	70.5[a]	

[a] Protein source x level was significant (P<.1) for 8 period means. All other differences not significant.

Table 3. Effect of Protein Source and Protein Level on Feed Conversion (g egg/g feed)

Protein Source	Dietary Protein Level - % 35-67 wks of age 17	15	13	Means
Soybean Meal	.40	.38	.36	.38
Sunflower Meal	.38	.37	.35	.37
Canola Meal	.37	.37	.37	.37
Means	.38[a]	.37[a,b]	.36[b]	

a,b Values with unlike superscript within an age group are significantly different ($P<.01$).

Table 4. Effect of Protein Source and Protein Level on Mortality, %

Protein Source	Dietary Protein Level -% 17	15	13	Means
Soybean Meal	10.6	8.6	15.0	11.5
Sunflower Meal	7.1	11.3	9.2	9.2
Canola Meal	16.6	14.7	9.4	13.6
Means	11.4	11.5	11.2	